REMARKS

In view of the following remarks, the Applicant respectfully requests reconsideration of the pending application.

Objections and Rejections

The Examiner's Action dated March 18, 2003, Paper No. 16:

1. finally rejects claims 2 and 3 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention;

2. finally rejects claims 1-3 and 5-7 under 35 U.S.C. § 103(a)) as being unpatentable over:

   a. United States Patent no. 5,404,446 entitled "Dual Buffer Video Display System for the Display of Asynchronous Irregular Frame Rate Video Data" which issued April 4, 1995, on an application filed by Ronald J. Bowater, Barry K. Aldred and Stephen P. Woodman ("the Bowater, et al. patent"); in view of

   b. United States Patent no. 5,838,678 entitled "Method and Device for Preprocessing Streams of Encoded Data to Facilitate Decoding Streams Back-to Back" which issued on an application filed July 24, 1996, by Joseph W. Davis and Shawn M. Hayes ("the Davis, et al. patent"); and

3. finally rejects claims 4 under 35 U.S.C. § 103(a)) as being unpatentable over:.

a. the Bowater, et al. patent as applied to claims 1-3 and 5-7; in view of

b. United States Patent no. 6,310,919 entitled "Method and Apparatus for Adaptively Scaling Motion Vector Information in an Information Stream Decoder" which issued October 30, 2001, on an application filed September 25, 1998, by Dinei Afonso Ferreira Florencio ("the Florencio patent").

The Claimed Invention

As recited in twice amended independent method claim 1, the present invention encompasses:

> [a] method for producing **a compressed video bitstream that includes compressed video data for a plurality of frames from data that specifies a single still image**
> * * *
> whereby decoding of the compressed video bitstream produces frames of video which produce images that do not appear to pulse visually. (Emphasis supplied)

The invention solves a problem that appears in images produced by a conventional Moving Picture Experts Group ("MPEG") decoder when decoding a conventionally MPEG encoded video bitstream that reproduce a still image, particularly a still image containing text. For conventionally encoded MPEG compressed video data, detail in decoded MPEG still images tends to be lower at the beginning of each group of pictures ("GOP") when an intra ("I") frame is decoded, increases during decoding of successive predicted ("P") frames and bidirectional ("B") frames in the GOP, only to decrease again upon decoding the next I frame. Thus, a decoding of

the MPEG compressed video bitstream of a still image frequently produces a video image that appears to pulse visually, usually at a frequency identical to the frequency at which GOPs occur in the compressed video bitstream, e.g. twice per second. This visual pulsing of the still image produced by decompressing a MPEG compressed video bitstream in many instances makes them commercially unacceptable.

Argument

Claims 1-3 and 5-7 Traverse Rejection for Obviousness Under 35 U.S.C. § 103(a)

A. Fetching Still Image Data

The preamble of twice amended independent method claim 1 expressly states that the claimed method must produce:

> a compressed video bitstream that includes compressed video data for a plurality of frames from data that specifies a single still image.

In producing the compressed video bitstream, the text of twice amended independent claim 1 expressly requires performing the method step of:

> fetching the data for the still image.

In rejecting claims 1-3 and 5-7 for obviousness under 35 U.S.C. § 103(a), the Examiner's Action dated March 18, 2003, in the 5th and 6th lines of the last paragraph on page 3 alleges that column 3, lines 19-34 and column 4, lines 42-68 in the Bowater, et al. patent disclose "fetching the data for the still image." Set forth below are texts excerpted from the Bowater, et al. patent

that the Examiner's Action alleges disclose "fetching the data for the still image."

> FIG. 1 shows a network 2 of computers 4, 6, 8 connected by an asynchronous communication channel 15 (e.g., LAN or ISDN). **A camera 16 at a first computer 4 obtains a video signal, normally of the user, which is compressed and submitted to the network.**[1] The signal is then transmitted down the communication channel in packet format before arriving at the destination computer 6. Typically, this second computer includes hardware such as the Intel/IBM ActionMedia II (AMII) card, which is responsible for actually decompressing and displaying the video image on the screen 9. In video conferencing applications, the reverse process also occurs; i.e., the second computer is simultaneously sending an image of its user back to the first computer 4 for display. It is also possible to set up multi-way conferences. (Column 3, lines 19-34) (Emphasis supplied.)
>
> The technique used to discard frames exploits the fact that, due to the limited bandwidth of the channel, the video signal is compressed before transmission over a computer based communication line. Basically, two types of compression, spatial and temporal, are used. In the former, the redundancy within a single frame is removed, for example, by using the fact that adjacent pixels often have closely related brightness and color

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[1] Note that the "video signal" obtained by the first computer 4 as described in this excerpt from the Bowater, et al. patent is not that of a "still image" as that term is used in pending independent claim 1. For a description of the type of "video signal" being produced by the video camera 16 refer to the Bowater, et al. patent in column 3 at lines 46-49 which expressly states:

> **[v]ideo images are captured at the source computer [4] at a frame rate of 15 frames per second (in this particular embodiment), which is sufficient to provide moderate quality video.**

The preceding text excerpted from the Bowater, et al. patent irrefutably establishes that the "video signal" produced by a video camera 16 is not the "data that specifies a single still image" as recited in the preamble of independent claim 1.

values. **A frame encoded using only spatial compression is known as a "still frame"**. Temporal compression achieves a further level of compression by exploiting the fact that the luminosity and color of the same pixel in two consecutive frames are, again, likely to be highly correlated. Therefore, in temporal compression, a frame is encoded as a "relative frame" in terms of its difference from the previous frame (we assume that a relative frame is also spatially compressed). The greatest reduction in data is achieved if every frame (apart from the first) is a relative frame, but this is highly error prone since the loss of a single frame will produce defects that persist for all subsequent frames. Therefore, as a compromise, **every Nth frame can be sent as a still frame**, with all intervening frames as relative frames, so that **the result of compression is a regularly spaced series of frames whose size varies somewhat according to the temporal and spatial content of the data and, of course, whether that particular frame is a still or relative frame**. In the present embodiment, N=6 (i.e., there are 5 relative frames for each still frame), although, sometimes, if there is a lot of movement so that successive frames are dissimilar, then the frequency of still frames is increased (i.e., N=6 is effectively an upper limit).[2] (Column 4, lines 42-68) (Emphasis supplied.)

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[2] Note that the phrase "still frame" as used in this excerpt from the Bowater, et al. patent identifies something which differs markedly from that identified by the phrase "still image" in pending independent claim 1.

The phrase "still frame" as used in this excerpt from the Bowater, et al. patent identifies a specific, particular type of frame of compressed data in a video bitstream, i.e. an I frame in the terminology of the present patent application, which in the present application:

1. is depicted three times in FIG. 2 by a box labeled with the reference number 54;
2. is one of three different types of frame data included in a Group of Pictures ("GOP") depicted in FIG. 2 that bears the reference number 52; and
3. which is therefore necessarily included within each the several boxes labeled with the reference number 52 that appear at the **far right hand side of FIG. 4**.

Conversely, the phrase "still image" as used in pending independent claim 1 refers to uncompressed video data indicated in the pending application by a box labeled with the reference number 104 that:

The preamble to independent claim 1 establishes that all the steps recited for the claimed method produce a "compressed video bitstream . . . from data that specifies a single still image." Applicant is unable to find anywhere in the excerpts quoted above from the Bowater, et al. patent "fetching the data for the still image" for the purpose of producing a "compressed video bitstream" as those phrases are used in pending independent claim 1. Accordingly, Applicant demands that specific word(s), phrase(s) or sentence(s) in the excerpts set forth above from the Bowater, et al. patent which disclose "fetching the data for the still image" be identified specifically citing column(s) and line number(s).

B. Encoding Still Image Data

In producing the compressed video bitstream, the text of twice amended independent claim 1 expressly requires performing the method step of:

> encoding the data for the single still image into data for an I frame.

In rejecting claims 1-3 and 5-7 for obviousness under 35 U.S.C. § 103(a), the Examiner's Action dated March 18, 2003, in the 6th and 7th lines of the last paragraph on page 3 alleges that column 4, lines 42-68 in the Bowater, et al. patent disclose "encoding the data for the single still image into data for an I frame." Set forth below is the text excerpted from the Bowater, et

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1. appears at the **far left hand side of FIG.** 4; and
2. is described by text appearing on page 14 at lines 4-7.

al. patent that the Examiner's Action alleges discloses "encoding the data for the single still image into data for an I frame."

> The technique used to discard frames exploits the fact that, due to the limited bandwidth of the channel, the video signal is compressed before transmission over a computer based communication line. Basically, two types of compression, spatial and temporal, are used. In the former, the redundancy within a single frame is removed, for example, by using the fact that adjacent pixels often have closely related brightness and color values. **A frame encoded using only spatial compression is known as a "still frame".** Temporal compression achieves a further level of compression by exploiting the fact that the luminosity and color of the same pixel in two consecutive frames are, again, likely to be highly correlated. Therefore, in temporal compression, a frame is encoded as a "relative frame" in terms of its difference from the previous frame (we assume that a relative frame is also spatially compressed). The greatest reduction in data is achieved if every frame (apart from the first) is a relative frame, but this is highly error prone since the loss of a single frame will produce defects that persist for all subsequent frames. Therefore, as a compromise, **every Nth frame can be sent as a still frame**, with all intervening frames as relative frames, so that the result of compression is a regularly spaced series of frames whose size varies somewhat according to the temporal and spatial content of the data and, of course, whether that particular frame is a still or relative frame. In the present embodiment, N=6 (i.e., there are 5 relative frames for each still frame), although, sometimes, if there is a lot of movement so that successive frames are dissimilar, then the frequency of still frames is increased (i.e., N=6 is effectively an upper limit). (Column 4, lines 42-68) (Emphasis supplied.)

Applicant agrees that the excerpt set forth above from the Bowater, et al. patent discloses encoding an I frame. However, Applicant is unable to find anything in the excerpt set forth above from the Bowater, et al. patent which discloses what type of data is being encoded into an I frame. If it is alleged that the excerpt set forth above from the Bowater, et al. patent discloses

that a single still image is being encoded into an I frame, Applicant demands that specific word(s), phrase(s) or sentence(s) in the excerpt set forth above from the Bowater, et al. patent which identify the type of data being encoded be identified specifically citing column(s) and line number(s).

C. **Storing the Encoded I Frame**

In producing the compressed video bitstream, the text of twice amended independent claim 1 expressly requires performing the method step of:

storing the encoded I frame data.

In rejecting claims 1-3 and 5-7 for obviousness under 35 U.S.C. § 103(a), the Examiner's Action dated March 18, 2003, in the 7th and 8th lines of the last paragraph on page 3 alleges that the box identified by the reference number 4 in FIG. 1 of the Bowater, et al. patent[3] disclose "storing the encoded I frame data." Since the box identified by reference number 4 in FIG. 1 of the Bowater, et al. patent omits descriptive text required by 35 U.S.C. §§ 1.83(a) and 1.83(c), **Applicant is baffled how, without the assistance provided by the text of pending independent claim 1, an unlabeled box in a drawing FIG. 1 of the Bowater, et al. patent that is identified by only the word "computer" in that reference's text can disclose "storing the encoded I frame data."**

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[3] An annotated copy of FIG. 1 from the Bowater, et al. patent is attached hereto as Exhibit A.

Set forth below are all texts which Applicant can identify in the Bowater, et al. patent which pertain to the box identified by the reference number 4 in FIG. 1.

> FIG. 1 shows a network 2 of computers 4, 6, 8 connected by an asynchronous communication channel 15 (e.g., LAN or ISDN). A camera 16 at a first computer 4 obtains a video signal, normally of the user, which is compressed and submitted to the network. (Column 3, lines 19-26)
>
> In video conferencing applications, the reverse process also occurs; i.e., the second computer is simultaneously sending an image of its user back to the first computer 4 for display. (Column 3, lines 29-34)
>
> Video images are captured at the source computer [4] at a frame rate of 15 frames per second (in this particular embodiment), which is sufficient to provide moderate quality video. (Column 3, lines 46-49)
>
> Changes in CPU activity at the source [computer 4] and destination computer[9] can also lead to variations in the effective frame arrival rate. (Column 3, lines 54-56)
>
> The system and method described can also be used to compensate, for example, for lost frames, or if there is a slight discrepancy between the clock rates of the source [computer 4] and destination computer[9]. (Column 7, lines 24-27)

Applicant is unable to find in any of the excerpts from the Bowater, et al. patent set forth above a disclosure of "storing the encoded I frame data."

If it is alleged that the box identified by the reference number 4 in FIG. 1 of the Bowater, et al. patent discloses "storing the encoded I frame data," Applicant demands an explanation of how, **without the assistance provided by the text of pending independent claim 1**, the unlabeled box in FIG. 1 identified by the reference number 4 discloses "storing the encoded I frame data."

D. Assembling a Compressed Video Bitstream

In producing the compressed video bitstream, the text of twice amended independent claim 1 expressly requires performing a method step which includes:

> assembling the compressed video bitstream by appropriately combining data for:
> at least a single copy of the stored I frame;
> at least one null frame.

In rejecting claims 1-3 and 5-7 for obviousness under 35 U.S.C. § 103(a), the Examiner's Action dated March 18, 2003, in the 8th through 11th lines of the last paragraph on page 3 alleges that the box identified by reference number 4 in FIG. 1, column 3, lines 19-34, column 4, lines 42-68, column 2, lines 48-62, column 6 line 59 to column 7[4] in the Bowater, et al. patent disclose:

> assembling the compressed video bitstream by appropriately combining data for:
> at least a single copy of the stored I frame;
> at least one null frame.

Set forth below are texts excerpted from the Bowater, et al. patent that the Examiner's Action alleges discloses:

> assembling the compressed video bitstream by appropriately combining data for:
> at least a single copy of the stored I frame;
> at least one null frame.

> FIG. 1 shows a network 2 of computers 4, 6, 8 connected by an asynchronous communication channel 15 (e.g., LAN or ISDN). A camera 16 at a first computer 4 obtains a video signal, normally of the user, which is compressed and submitted to the network. The signal is

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[4] Page 3 of the Examiner's Action in line 11 provides no line number for the citation to column 7. Applicants therefor include in the excerpt from the Bowater, et al. patent all the text in column 7 preceding the claims.

then transmitted down the communication channel in packet format before arriving at the destination computer 6. Typically, this second computer includes hardware such as the Intel/IBM ActionMedia II (AMII) card, which is responsible for actually decompressing and displaying the video image on the screen 9. In video conferencing applications, the reverse process also occurs; i.e., the second computer is simultaneously sending an image of its user back to the first computer 4 for display. It is also possible to set up multi-way conferences. (Column 3, lines 19-34)

The technique used to discard frames exploits the fact that, due to the limited bandwidth of the channel, the video signal is compressed before transmission over a computer based communication line. Basically, two types of compression, spatial and temporal, are used. In the former, the redundancy within a single frame is removed, for example, by using the fact that adjacent pixels often have closely related brightness and color values. A frame encoded using only spatial compression is known as a "still frame". Temporal compression achieves a further level of compression by exploiting the fact that the luminosity and color of the same pixel in two consecutive frames are, again, likely to be highly correlated. Therefore, in temporal compression, a frame is encoded as a "relative frame" in terms of its difference from the previous frame (we assume that a relative frame is also spatially compressed). The greatest reduction in data is achieved if every frame (apart from the first) is a relative frame, but this is highly error prone since the loss of a single frame will produce defects that persist for all subsequent frames. Therefore, as a compromise, every Nth frame can be sent as a still frame, with all intervening frames as relative frames, so that the result of compression is a regularly spaced series of frames whose size varies somewhat according to the temporal and spatial content of the data and, of course, whether that particular frame is a still or relative frame. In the present embodiment, N=6 (i.e., there are 5 relative frames for each still frame), although, sometimes, if there is a lot of movement so that successive frames are dissimilar, then the frequency of still frames is increased (i.e., N=6 is effectively an upper limit). (Column 4, lines 42-68)

It is also advantageous, on occasions **when the first buffer is empty and the second buffer needs more frames, for the control process to create null frames for transfer to the second buffer**. This, again, reduces the risk of buffer starvation of the second buffer. Since

any nulls so inserted add to the effective buffering, it is also useful to be able to delete delayed frames when they do finally arrive, so as to allow the displayed image to catch up with the received one. In a system in which the video is compressed as a sequence of still and relative frames, this is preferably achieved when the first buffer is full by: (i) if the incoming frame is a still frame, flushing the contents of the first buffer, or (ii) if the incoming frame is a relative frame, flushing the contents of the first buffer up to the first still frame. (Column 2, lines 48-62) (Emphasis supplied.)

The control process is responsible first for receiving data into the circular buffer, and then for forwarding it to the AVK. There is no control over output from the AVK, which is at a fixed rate. As explained in more detail below, the AVK requests frames from the circular buffer as required. Clearly, if frames are present in the circular buffer, then these can be forwarded to the AVK. However, in video conferencing or other interactive applications where the overall amount of buffering is limited, **there may occasionally be particularly long delays on the network during which time the circular buffer empties. In this case, the control process reacts by loading the AVK with null frames. A null frame is essentially the same as the preceding frame, so that, as far as the viewer is concerned, video image temporarily freezes**. Thus, each time the control process fails to find frames in the circular buffer, the requisite number of null frames are loaded into the AVK instead.

Although the user may not notice the insertion of individual null frames, each null frame adds to the overall delay in the system (i.e., it is effectively another form of buffering). If more and more null frames are inserted into the video stream, then this will, again, lead to an intrusive delay between transmission and display. This problem can be overcome by the circular buffer throwing away real data when the delayed frames do finally arrive. These frames are then effectively lost, allowing the displayed image to catch up with the incoming signal. It is the presence of two buffers that gives the flexibility to lose frames in this way, and so cope with occasional delays longer than T(L). (Column 4, lines 11-41) (Emphasis supplied.)

Once the control process has determined the number of frames to transfer to the AVK, it can either send this as a single request, or as an appropriate number of requests for individual frames. In the latter case, the

circular buffer can respond simply to each request by transferring a frame if available, or inserting a null frame if not.

The particular embodiment described above is determined to some extent by the hardware used and, in particular, to allow operation with the AMII card. This card was designed originally for multimedia applications, where the AVK could be filled with many frames from disk, without regard to the lag between reading and display. Thus, up to 100 frames representing several seconds of video could, typically, be preloaded into the AVK buffer. This is partly why the AVK does not cope well with buffer starvation and requires a long time to reset, since it was never intended to operate at such low buffering levels. By contrast, the circular buffer is relatively unaffected by emptying. This is why the control process is happy to exhaust the frames in the circular buffer to keep the AVK supplied, and even to insert null frames if necessary. It should be noted that, if the relative consequences of buffer starvation were altered, this strategy would have to be adjusted appropriately.

The control process can be implemented as a standard task or thread on the workstation, whilst the circular buffer is maintained in general storage. However, it may also be possible to implement some of the function in hardware if required. Likewise, the hardware/software mix of the AMII card or equivalent may also be changed. The system and method described can also be used to compensate, for example, for lost frames, or if there is a slight discrepancy between the clock rates of the source and destination computers. (Column 6, line 59 through column 7)

As set forth above in section B., Applicant agrees that the excerpts set forth above from the Bowater, et al. patent disclose encoding an I frame. However, Applicant is unable to find anything in the excerpts set forth above from the Bowater, et al. patent which discloses "assembling the compressed video bitstream by appropriately combining data for . . . at least **a single copy of the stored I frame**."

Applicant further agrees that the excerpts set forth above from the Bowater, et al. patent disclose creating at the destina-

tion computer 6 null frames for transfer to the second buffer of the destination computer 6 when the first buffer is empty and the second buffer needs more frames. Similarly Applicant further agrees that the excerpts set forth above from the Bowater, et al. patent discloses that:

> there may occasionally be particularly long delays on the network during which time the circular buffer [in the destination computer 6] empties. In this case, the control process [running in the destination computer 6] reacts by loading the AVK [in the destination computer 6] with null frames. A null frame is essentially the same as the preceding frame, so that, as far as the viewer is concerned, video image temporarily freezes.

However, Applicant is unable to find anything in the excerpts set forth above from the Bowater, et al. patent which discloses "assembling the compressed video bitstream by appropriately combining data for . . . at least **a single copy of [an] I frame** and **at least one null frame**."

If it is alleged that the excerpts set forth above from the Bowater, et al. patent disclose "assembling the compressed video bitstream by appropriately combining data for . . . at least a single copy of [an] I frame and at least one null frame.", Applicant demands that specific word(s), phrase(s) or sentence(s) in the excerpts set forth above from the Bowater, et al. patent which disclose "assembling the compressed video bitstream by appropriately combining data for . . . at least a single copy of [an] I frame and at least one null frame" be identified specifically citing column(s) and line number(s).

E. Claim 1's Whereby Clause

Independent claim 1, after reciting the four (4) method steps set forth above in Sections A. through D., concludes with a whereby clause which recites that these four method steps produce a compressed video bitstream which upon:

> decoding of the compressed video bitstream produces frames of video which produce images that do not appear to pulse visually.

In rejecting claims 1-3 and 5-7 for obviousness under 35 U.S.C. § 103(a), the Examiner's Action dated March 18, 2003, in lines 11 through 13 of the last paragraph on page 3 and in lines 1 and 2 at the top of page 4 alleges that column 3, line 19 through column 4, line 41 in the Bowater, et al. patent disclose "decoding of the compressed video bitstream produces frames of video which produce images that do not appear to pulse visually." Set forth below is the text excerpted from the Bowater, et al. patent that the Examiner's Action alleges discloses "decoding of the compressed video bitstream produces frames of video which produce images that do not appear to pulse visually."

> FIG. 1 shows a network 2 of computers 4, 6, 8 connected by an asynchronous communication channel 15 (e.g., LAN or ISDN). A camera 16 at a first computer 4 obtains a video signal, normally of the user, which is compressed and submitted to the network. The signal is then transmitted down the communication channel in packet format before arriving at the destination computer 6. Typically, this second computer includes hardware such as the Intel/IBM ActionMedia II (AMII) card, which is responsible for actually decompressing and displaying the video image on the screen 9. In video conferencing applications, the reverse process also occurs; i.e., the second computer is simultaneously sending an image of its user back to the first computer 4 for display. It is also possible to set up multi-way conferences.

With reference now to FIG. 2, the incoming video signal from the communication subsystem 15 arrives at the workstation 13 for display on the associated monitor 9. The signal is transferred first to a buffer 23, and then to the AMII card 125 or, more particularly, to the AudioVisual Kernel (AVK) interface buffer 25 of the AMII card. The buffer 23 provides a FIFO queue, conveniently implemented as a circular buffer. A control process 27 is responsible first for reading incoming data into the circular buffer, and then for transferring data from the circular buffer to the AVK.

Video images are captured at the source computer at a frame rate of 15 frames per second (in this particular embodiment), which is sufficient to provide moderate quality video. This is also the rate at which they are read out of the AVK to the screen. However, the transmission rate over the network is variable, depending on network load, etc., so that the arrival rate at the end of the computer subsystem departs from this 15 Hz clock. Changes in CPU activity at the source and destination computers can also lead to variations in the effective frame arrival rate. Individual frames can have either a positive or negative offset from their nominal arrival time, although it is assumed that frames do, in fact, arrive in the correct sequence. **It should be noted that the variation in arrival times is such that, even if the hardware could display each frame directly on arrival, the resulting sequence would be so temporally distorted as to be unwatchable.** Thus, some form of buffering is essential.

Together, the AVK and circular buffer compensate for the variable arrival rate of the video frames by introducing a time-lag, T(L), between the received and displayed images. Any frame arriving within T(L) of its nominal arrival time can be properly displayed. Only if a frame arrives more than T(L) late, will the AVK and circular buffer empty and the video image will freeze.[5] To decrease the risk of buffer starvation, the buffer size can be increased to make T(L) larger, but with a 15

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[5] The text of the Bowater, et al. patent expressly states that the invention disclosed there does not prevent video images from freezing. In column 4 at lines 22-26 the Bowater, et al. patent expressly dec;ares that:

> In this case, the control process reacts by loading the AVK with null frames. A null frame is essentially the same as the preceding frame, so that, **as far as the viewer is concerned, video image temporarily freezes**.

frames per second transmission rate, storing only 10 frames adds a delay of 2/3 second. If the effectiveness of interactive applications such as video conferencing is not to be seriously degraded, only a handful of frames can be buffered with T(L) correspondingly small.

The control process is responsible first for receiving data into the circular buffer, and then for forwarding it to the AVK. There is no control over output from the AVK, which is at a fixed rate. As explained in more detail below, the AVK requests frames from the circular buffer as required. Clearly, if frames are present in the circular buffer, then these can be forwarded to the AVK. However, **in video conferencing or other interactive applications where the overall amount of buffering is limited, there may occasionally be particularly long delays on the network during which time the circular buffer empties. In this case, the control process reacts by loading the AVK with null frames. A null frame is essentially the same as the preceding frame, so that, as far as the viewer is concerned, video image temporarily freezes**. Thus, each time the control process fails to find frames in the circular buffer, the requisite number of null frames are loaded into the AVK instead.

Although the user may not notice the insertion of individual null frames, each null frame adds to the overall delay in the system (i.e., it is effectively another form of buffering). **If more and more null frames are inserted into the video stream, then this will, again, lead to an intrusive delay between transmission and display**. This problem can be overcome by the circular buffer throwing away real data when the delayed frames do finally arrive. These frames are then effectively lost, allowing the displayed image to catch up with the incoming signal. It is the presence of two buffers that gives the flexibility to lose frames in this way, and so cope with occasional delays longer than T(L). (Column 3, line 19 through column 4, line 41) (Emphasis supplied.)

Applicant is unable to find anywhere in the excerpt set forth above from the Bowater, et al. patent a disclosure that:

> decoding of the compressed video bitstream produces frames of video which produce images that **do not appear to pulse visually**.

Rather, Applicant finds in the text identified in the Examiner's action only express admissions that:

1. lacking the invention disclosed in the Bowater, et al. patent "the resulting sequence [of video images] would be so temporally distorted as to be unwatchable;" and
2. using the invention disclosed in the Bowater, et al. patent "as far as the viewer is concerned, video image temporarily freezes."

If it is alleged that the excerpt set forth above from the Bowater, et al. patent discloses that "decoding of the compressed video bitstream produces frames of video which produce images that do not appear to pulse visually," Applicant demands that specific word(s), phrase(s) or sentence(s) in the excerpt set forth above from the Bowater, et al. patent which discloses that "decoding of the compressed video bitstream produces frames of video which produce images that do not appear to pulse visually" be identified specifically citing column(s) and line number(s).

F. **Disclosure Missing from the Bowater, et al. Patent**

In rejecting twice amended independent claim 1, contradicting the allegations set forth above in Section C., in a text quoted below from page 4, lines 4-6 the Examiner's Action dated March 18, 2003, **admits that the Bowater, et al. patent fails to disclose**:

> encoding the data for the single still image into data for an intra frame, storing the encoded I frame data, and wherein the assembling the compressed video bitstream combines at least a single copy of the stored I frame as claimed **in claim 1**.

Applicant first notes that the preceding admission is incomplete. That is, the admission fails to mention the null frame expressly required by the text of this method step in independent claim 1.

> assembling the compressed video bitstream by appropriately combining data for:
>
> at least a single copy of the stored I frame;
>
> **at least one null frame**; and
>
> various headers required for decodability of the compressed video bitstream.

In an attempt to plug the admitted hole in the disclosure of the Bowater, et al. patent, the Examiner's Action on page 5 in lines 2-4 then identifies in text quoted below FIGs. 2, 3A, 3B, 5, and 6 apparently together with FIG. 16 in the Davis, et al. patent.

> Davis et al discloses a method and device for preprocessing streams of encoded data to facilitate decoding streams back to back as shown in Figures 2, 3A, 3B, 5, and 6, and teaches the conventional MPEG video compression processings involving I, P, and B frames (see figure 16).

Copies of FIGs. 2, 3A, 3B, 5, 6 and 16 excerpted from the Davis, et al. patent are attached hereto as Exhibit B.

Noting that the Examiner's Action dated March 18, 2003, fails to identify any text in the Davis, et al. patent pertaining to its rejection of independent claim 1, set forth below are descriptions for the cited FIGs. excerpted from the text of the Davis, et al. patent.

> FIG. 2 is a diagram which illustrates the syntax of an MPEG II PES packet.
>
> FIGS. 3a and 3b illustrate the organization of an MPEG II video sequence.
>
> FIG. 4 illustrates the structure of a sequence header of the MPEG II video sequence of FIGS. 3a and 3b.

FIG. 5 illustrates the structure of a picture header of the MPEG II video sequence of FIGS. 3a and 3b.

FIG. 6 illustrates the structure of a group of pictures header of the MPEG II video sequence of FIGS. 3a and 3b.

* * *

FIG. 16 is a chart which illustrates an example of the ordering of various types of compressed picture frames at various stages of encoding video, transmitting an MPEG stream, and decoding.

Having thus nebulously identified seven (7) FIGs. selected from the Davis, et al. patent, the Examiner's Action, without identifying any specific element in the cited FIGs. or any text in the Davis, et al. patent, then alleges on page 5 in lines 5-13 that:

> [t]herefore, **it would have been obvious to one of ordinary skill in the art**, having the Bowater et al and Davis et al references in front of him/her and the general knowledge of intra frame processings within the MPEG video compression standard, **would have had no difficulty in providing the intra frame processings as taught by Davis et al within the encoder and decoder of Bowater et al thereby providing the encoding of the data** for the single still image into data for an intra frame, storing the encoded I frame data, and wherein the assembling the compressed video bitstream combines at least a single copy of the stored I frame if such intra frame processing were not already within the encoding/decoding of Bowater et al **for the same well known purposes as claimed**. (Emphasis supplied.)

Accepting the preceding allegation for the sole purpose of analysis, Applicant observes that it fails to justify rejecting pending independent claim 1. The statement fails to justify rejecting independent claim 1 because it does not identify any motivation or suggestion for combining the disclosures of the Bowater, et al. and Davis, et al. patents. The nearest thing which the preceding excerpt from the Examiner's Action contains which

could be construed as identifying a motivation or suggestion for combining the disclosures of the two references is the statement that:

> one of ordinary skill in the art, . . . , **would have had no difficulty** in providing the intra frame processings as taught by Davis et al within the encoder and decoder of Bowater et al thereby providing the encoding of the data . . . for the same well known purposes as claimed.

Applicant further observes that there appears to be no justification anywhere in the Examiner's Action for the allegation in the preceding quotation that the claimed invention's "purpose" is "well known." If it is alleged that the purposes of the invention encompassed by pending claim 1 were "well known" when this patent application was filed now almost five (5) years ago, Applicant strictly demands proof of such knowledge.

Rather than identifying in the Bowater, et al. and Davis, et. al. a motivation or suggestion that they could be advantageously combined to produce the invention encompassed by pending independent claim 1, Applicant respectfully submits that the text quoted above from the Examiner's Action fails to **explain why combining references is proper indicating why one skilled in the art would make a combination or substitution** as required by Ex parte Skinner, 2 USPQ2d 1788, 1790 (Bd. Pat. App. & Int. 1986).

Applicant respectfully submits that what the excerpt quoted above from the Examiner's action truly says is that if one of ordinary skill in the art already knew about the invention, then they could selectively choose elements from the Bowater, et al. and

Davis, et al. patents to reproduce the invention. **It is impermissible to first ascertain factually what the inventor did and then view the prior art in such a manner as to select from the random facts of that art only those which may be modified and then utilized to reconstruct the invention from such prior art**. Panduit Corp. v. Dennison Manufacturing Co., 774 F.2d 1082, 1092, 227 USPQ 337, 343 (Fed. Cir. 1985).

> A critical step in analyzing the patentability of claims pursuant to section 103(a) is casting the mind back to the time of invention, to consider the thinking of one of ordinary skill in the art, guided only by the prior art references and the then-accepted wisdom in the field. See Dembiczak, 175 F.3d at 999, 50 USPQ2d at 1617. Close adherence to this methodology is especially important in cases where the very ease with which the invention can be understood may prompt one "to fall victim to the insidious effect of a hindsight syndrome wherein that which only the invention taught is used against its teacher." Id. (quoting W.L. Gore & Assocs., Inc. v. Garlock, Inc., 721 F.2d 1540, 1553, 220 USPQ 303, 313 (Fed. Cir. 1983)). In Re Werner Kotzab, 217 F.3d 1365, 1369, 55 USPQ2d 1313, 1316 (Fed. Cir. 2000).
>
> Although the suggestion to combine references may flow from the nature of the problem, see Pro-Mold & Tool Co. v. Great Lakes Plastics, Inc., 75 F.3d 1568, 1573, 37 USPQ2d 1626, 1630 (Fed. Cir. 1996), "**[d]efining the problem in terms of its solution reveals improper hindsight in the selection of the prior art relevant to obviousness**," Monarch Knitting Mach. Corp. v. Sulzer Morat Gmbh, 139 F.3d 877, 880, 45 USPQ2d 1977, 1981 (Fed. Cir. 1998).

The Applicant respectfully submits that the excerpt quoted above from the Examiner's Action:

1. clearly defines the problem solved by the invention encompassed by pending claim 1 in terms of its solution, and then

2. views the prior art of the Bowater, et al. and Davis, et al. patents in such a manner as to select from their random facts only those which may be modified and then utilized to reconstruct the invention encompassed by pending claim 1.

Modification of the Bowater, et al, Patent Is Unobvious

A camera 16 at **a first computer 4 obtains a video signal, normally of the user, which is compressed and submitted to the network. The [compressed] signal is then transmitted down the communication channel in packet format before arriving at the destination computer 6**. (Column 3, lines 19-26) (Emphasis supplied.)

With reference now to FIG. 2, **the incoming video signal from the communication subsystem 15 arrives at the workstation 13 [of the destination computer 6] for display on the associated monitor 9. The signal is transferred first to a buffer 23, and then to the AMII card 125 or, more particularly, to the AudioVisual Kernel (AVK) interface buffer 25 of the AMII card**. The buffer 23 provides a FIFO queue, conveniently implemented as a circular buffer. **A control process 27 is responsible first for reading incoming data into the circular buffer, and then for transferring data from the circular buffer to the AVK**. (Column 3, lines 35-45) (Emphasis supplied.)

The control process is responsible first for receiving data into the circular buffer, and then for forwarding it to the AVK. There is no control over output from the AVK, which is at a fixed rate. As explained in more detail below, the AVK requests frames from the circular buffer as required. Clearly, if frames are present in the circular buffer, then these can be forwarded to the AVK. However, **in video conferencing or other interactive applications where the overall amount of buffering is limited, there may occasionally be particularly long delays on the network during which time the circular buffer empties. In this case, the control process reacts by loading the AVK with null frames**. (Column 4, lines 11-28) (Emphasis supplied.)

The excerpts set forth above from the Bowater, et al. patent establish that video data compression occurs in the first computer 4. The excerpts also establish that it is a "control process" operating in the workstation 13 of the destination computer 6 which adds null frames to a buffer that is located in the workstation 13.

Since the invention claimed in the present application is:

> [a] method for producing a compressed video bitstream that includes compressed video data for a plurality of frames from data that specifies a single still image,

in the context of the disclosure of the Bowater, et al. patent compression of the single still image must necessarily occur in the first computer 4. The adaptation of the Bowater, et al. patent's disclosure set forth in the Examiner's Action's rejection of claims 1-7 for obviousness under 35 U.S.C. § 103(a) necessarily requires moving the control process, which adds null frames to the buffer, from the workstation 13 of the destination computer 6 to the first computer 4. **Such a modification of the disclosure of the Bowater, et al. patent renders the network 2 of computers 4, 6, 8 disclosed in the Bowater, et al. patent inoperable for the purpose intended in the Bowater, et al. patent**.

Under controlling legal authority set forth in detail below, modifying a reference to such an extent that it becomes unusable for its intended purpose is an unobvious modification. For the reasons set forth above, combining the disclosure of the Bowater, et al. patent with that of any other reference(s) in rejecting pending claims 1-7 necessarily requires modifying the disclosure of the Bowater, et al. patent so it becomes inoperable for its

intended purpose. Consequently, claims 1-7 traverse rejection for obviousness under 35 U.S.C. § 103(a) based upon a combination of the Bowater, et al. patent with any other reference(s).

In In re Gordon, 733 F.2d 900, 902, 221 USPQ 1125, 1127 (Fed. Cir. 1984) the Court of Appeals for the Federal Circuit ("CAFC") reversed a Board of Appeals decision that a patent application's claims were obvious under 35 U.S.C. § 103 holding "that although a prior art [fuel filter] device could have been turned upside down, that did not make the modification obvious unless the prior art fairly suggested the desirability of turning the device upside down." Continental Can Co. USA, Inc. v. Monsanto Co. 948 F.2d 1264, ___, 20 USPQ2d 1746, 1751 (Fed. Cir. 1991). "Indeed, if the French [fuel filter] apparatus were turned upside down, it would be rendered inoperable for its intended purpose." In re Gordon, supra citing Application of Schulpen 390 F.2d 1009, 1013, 157 USPQ 52, 55 (CCPA 1968). In Application of Schulpen the Court of Custom and Patent Appeals ("CCPA") reversed a Board of Appeals decision that a patent application's claims were obvious under 35 U.S.C. § 103 because an allegedly obvious modification of the reference would render the apparatus inoperable for producing the apparatus' intended product. A rejection of claims under 35 U.S.C. § 103 based upon inserting negative lenses, disclosed in one reference, into a camera accessory housing between a lens and a film plane, disclosed in a basic reference, was improper because it destroyed the basic reference for its intended purpose. Ex parte Westphalen, 159 USPQ 507, 508 (Bd. App. 1967). Similarly, claims to a deeply-

drawable composite formed by coating a partially drawn non-woven fleece, allegedly disclosed in one reference, with a deep-drawable plastic film, disclosed in a second reference, were improperly rejected as being obvious because the combination destroyed the invention disclosed in the first reference. Ex parte Hartman, 186 USPQ 366, 367 (Bd. App. 1974).

The Manual of Patent Examining Procedure ("MPEP") § 2143.01, Eighth Edition, August 2001, at p. 2100-124 - 125, in applying the controlling legal authority cited above expressly instructs examiners that claims are not to be rejected for obviousness under 35 U.S.C. § 103(a) relying upon a combination of references that renders one of the references inoperable for that reference's intended purpose. This text in MPEP expressly states as follows.

> THE PROPOSED MODIFICATION CANNOT RENDER THE PRIOR ART UNSATISFACTORY FOR ITS INTENDED PURPOSE
>
> If proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. In re Gordon, 733 F2d 900, 221 USPQ 1125 (Fed. Cir. 1984) (Claimed device was a blood filter assembly for use during medical procedures wherein both the inlet and outlet for the blood were located at the bottom end of the filter assembly, and wherein a gas vent was present at the top of the filter assembly. The prior art reference taught a liquid strainer for removing dirt and water from gasoline and other light oils wherein the inlet and outlet were at the top of the device, and wherein a pet-cock (stopcock) was located at the bottom of the device for periodically removing the collected dirt and water. The reference further taught that the separation is assisted by gravity. The Board concluded the claims were prima facie obvious, reasoning that it would have been obvious to turn the reference device upside down. The court reversed, finding that if the prior art device was turned upside down it would be inoperable for its intended

purpose because the gasoline to be filtered would be trapped at the top, the water and heavier oils sought to be separated would flow out of the outlet instead of the purified gasoline, and the screen would become clogged.).

Claims 2 and 3 Traverse Rejection Under 35 U.S.C. § 112, Second Paragraph

The Examiner's Action dated March 18, 2003, continues maintaining a rejection of claims 2 and 3 set forth in an Examiner's Action dated February 12, 2002, Paper No. 12, for being indefinite under 35 U.S.C. § 112, second paragraph. Claim 2 requires that:

> the assembled compressed video bitstream is decodable in accordance with the MPEG-1 standard . . .

Claim 3 requires that:

> the assembled compressed video bitstream is decodable in accordance with the MPEG-2 standard . . .

In maintaining the rejection of claims 2 and 3, the Examiner's Action dated February 12, 2002, states:

> [t]he particular claim to the "MPEG-1" and "MPEG-2" recommendations as shown in claims 2 and 3, respectively, are indefinite because there are many versions of the MPEG-1 and MPEG-2 recommendations and the recommends are continuously updated. The scope of the claim limitations cannot change over time, and unless the specification states a specific MPEG-1 and MPEG-2 version and date or a copy of the MPEG-1 and MPEG-2 recommendations are provided, the claims are indefinite. The recommendations are constantly changing, even up to the filing date of the application. Basically, the time frame between when the invention was reduced to practice till the time the application is filed, for example, there could be various versions of the recommendations. And unless the versions and dates of the recommendations are provided, the metes and bounds of the claimed limitations are not clearly set forth, and thus renders the claims indefinite.

First, it appears that the issue of the "Risk of the Future" which underlies the preceding rejection frequently arises in the context of claim rejections for lack of enablement rather than for claim indefiniteness. See Chisum § 7.03[3][c] and In re Metcalfe, 410 F.2d 1378, 161 USPQ 789 (CCPA 1969). In re Metcalfe holds that insufficiency of disclosure rejections due to "Risk of the Future" are to be decided on a case-by-case basis using a rule of reason analysis. Id. at 1382, 792. In re Metcalfe observes that there always exist a "possibility," however remote, that at some future date a material or an apparatus might no longer be available for practicing a patented invention, but that the existence of such a risk should not bar the issuance of a patent in every instance.

In *Ex parte* Saceman, 27 USPQ2d 1472, 1474 (Bd. Pat. App. & Int'f 1993), the Board of Appeals, following the holding of In re Metcalfe, held that "Risk of the Future" indefiniteness of claim terms must also be decided using a rule of reason analysis applied to the facts of the case. In *Ex parte* Logan, 20 USPQ2d 1465, 1469-70 (Bd. Pat. App. & Int'f 1991), the Board of Appeals ordered that a patent issue on an application having a specification which used "pseudo-code", metaphors and relative terminology to describe a computer-implemented patient inspiration detection method.

In the present application, the two Examiner's Action rejections of claims 2 and 3 quoted above allege that the claims will become indefinite "because there are many versions of the MPEG-X recommendations and the recommends are continuously updated." Appellant observes that the various versions of the MPEG-[X]

specification have all been published by the International Organization for Standardization ("ISO") and/or International Electrotechnical Commission ("IEC"). Thus, the use of metaphors and relative terminology, respectively MPEG-1 and MPEG-2 in claims 2 and 3 that Board of Appeals approved for computer related inventions in In *Ex parte* Logan, is reasonable for pending claims 2 and 3 because there exist little likelihood that ISO's and/or IEC's publications of the MPEG-1 and MPEG-2 specifications will become unavailable during the term of a patent issuing on the present application.

If need there be for further evidence that the rejection of claims 2 and 3 for indefiniteness under 35 U.S.C. § 112, second paragraph, is specious, the declaration of Mark Conover which accompanied a response to an October 11, 2002, Examiner's Action which was received by the United States Patent and Trademark Office ("USPTO") on January 13, 2003, establishes that:

> despite minor changes occurring in the MPEG specification the invention disclosed and claimed in my patent application has been used successfully without change by one customer who has used it for several years probably in millions of instances!

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Conclusion

For the detailed reasons appearing in titled sections A. through E. above, Applicant respectfully submits that the Bowater, et al. patent fails to disclose or to even suggest:

1. fetching the data for a still image;[6] or

2. encoding data for a single still image into an I frame;[7] or

3. storing the encoded I frame data;[8] or

4. combining data for at least a single copy of an I frame and at least one null frame:[9] or

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[6] Rather, the Bowater, et al. patent discloses a conventional television camera producing motion video at a 15 frame per second rate. See column 3, lines 21-23 and column 3, lines 46-49.

[7] Rather the Bowater, et al. patent discloses the spatial and temporal compression of a series of frames of video data received from a television camera at 15 frames per second into "still frames," i.e. I frames, and "relative frames." See column 4, lines 42-68.

[8] Neither of the cited references, but only the present application discloses storing the I frame data produced by encoding the data for a single still image.

[9] The Bowater, et al. patent first discloses that compressed data for sequences of motion video frames would be so temporally distorted as to be unwatchable at the destination computer 6 without buffering. See column 3, lines 59-64. Then the Bowater, et al. patent discloses that adding buffers to the destination computer 6 makes compressed data for sequences of motion video frames viewable. However, if due to network delays compressed video data fails to arrive at the destination computer 6 the displayed image freezes. See column 3, line 65 through column 4, line 3. Finally, the Bowater et al. patent discloses inserting null frames into the buffer of the destination computer 6 when compressed video data fails to arrive due to network delays. However, even if null frames are inserted into the buffer a viewer still

5. that the combination of a single copy of an I frame and at least one null frame prevents an image from appearing to pulse visually.[10]

Furthermore, Applicant respectfully submits that for the detailed reasons appearing in titled section E. there exists no motivation or suggestion to combine the disclosures of Bowater, et al. and the Davis, et all patents.

Not only does the combination of the Bowater, et al. patent fail to disclose or to even suggest essential method steps in the invention encompassed by pending independent claim 1, and not only do the Bowater, et al. and Davis, et al. patents lack a motivation or suggestion for their combination to obtain the invention encompassed by pending independent claim 1, for the detailed reasons set forth above the rejection of claims 1-7 for obviousness under 35 U.S.C. § 103 necessarily requires modifying the disclosure of the Bowater, et al. patent to such an extent that it is no longer operable for its intended purpose. Under controlling legal authority, such a modification of the disclosure of the Bowater, et al. patent is an unobvious modification which destroys that reference as a basis for rejecting pending claims 1-7 for obviousness under 35 U.S.C. § 103.

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sees the image freeze. See column 4, 22-26.

[10] The Bowater, et al. patent discloses only that if due to network delays compressed video data fails to arrive at the destination computer 6 the displayed image freezes. See column 3, line 65 through column 4, line 3, and column 4, 22-26.

For each of the three independent and distinct reasons set forth above, Applicant respectfully submits that:

1. twice amended independent claims 1 together with claims 2-7 depending therefrom:

   a. traverse rejection for obviousness under 35 U.S.C. § 103(a) based upon a combination of the Bowater, et al. patent with any other reference(s); and

   b. are allowable over the combinations of references set forth in the Examiner's Action dated March 18, 2003; and

2. therefore requests that the rejection of claims 1-7 for obviousness under 35 U.S.C. § 103(a) be withdrawn.

Finally, for the reasons set forth in greater detail above the Applicant respectfully submits that claims 2 and 3 traverse the rejection for indefiniteness under 35 U.S.C. § 112, second paragraph, set forth in the March 18, 2003, Examiner's Action.

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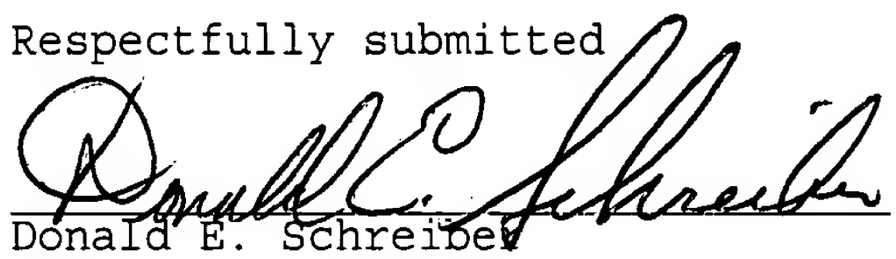
For the preceding reasons, the Applicant respectfully requests that all rejections of claims 1-7 set forth in the Examiner's Action dated March 18, 2003, be withdrawn, and that this patent application pass immediately to issue.

Respectfully submitted



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